## CLAIMS

1. An isolated polynucleotide comprising all or part of:

   a) the nucleotide sequence SEQ ID NO. 1 provided that such nucleotide sequence comprises at least one SNP selected from the group consisting of c527a, g1023a, 96-100del(aattt), t110c, 139-144del(acttta), t338a, t363c, c427t, and c1047t; or

   b) a nucleotide sequence complementary to a nucleotide sequence under a).

2. The isolated polynucleotide of claim 1, comprising nucleotides 511 to 1077 of SEQ ID NO. 1, provided that the sequence contains at least one coding SNP selected from the group consisting of c527a and g1023a.

3. The isolated polynucleotide of claim 1, wherein said polynucleotide comprises at least 10 nucleotides.

4. An isolated polynucleotide that codes for a polypeptide comprising the amino acid sequence SEQ ID NO. 2, and having at least one coding SNP selected from the group consisting of A6D and M148I/M171I.

5. A method for identifying or amplifying all or part of a polynucleotide having 80 to 100% identity with nucleotide sequence SEQ ID NO. 1 comprising contacting said polynucleotide with the polynucleotide of claim 1 under conditions which will permit hybridization to occur, and detecting whether said hybridization has occurred.

6. A method for genotyping all or part of a polynucleotide having 80 to 100% identity with nucleotide sequence SEQ ID NO. 1 comprising the steps of amplifying a region of interest in the genomic DNA of a subject or a population of subjects, and determining the allele of at least one of the following positions in the nucleotide sequence SEQ ID NO. 1: 527, 1023, 96-100, 110, 139-144, 338, 363, 427, and 1047.

7. The method of claim 6, wherein the genotyping is carried out by minisequencing.

8. A recombinant vector comprising a polynucleotide according to claim 1.

9. A host cell comprising a recombinant vector according to claim 8.

10. A method for separating a polypeptide, comprising cultivating a host cell according to claim 9 in a culture medium and separating said polypeptide from the culture medium.

11. The polypeptide encoded by the isolated polynucleotide of claim 1.

12. An isolated polypeptide comprising all or part of amino acid sequence SEQ ID NO. 2 and having at least one coding SNP selected from the group consisting of A6D and M148I/M171I.

13. The polypeptide according to claim 11, comprising amino acids 24 through 188 of the amino acid sequence SEQ ID NO. 2, and having at least one coding SNP selected from the group consisting of A6D and M148I/M171I.

14. A method for obtaining an immunospecific antibody, comprising immunizing an animal with the polypeptide according to claim 11, and collecting said antibody from said animal.

15. The immunospecific antibody resulting from the method of claim 14.

16. A method for identifying an agent among one or more compounds to be tested which activates or inhibits activity of an isolated polypeptide comprising all or part of amino acid sequence SEQ ID NO. 2 and having at least one coding SNP selected from the group consisting of A6D and M148I/M171I, said method comprising:

a) providing host cells comprising the recombinant vector according to claim 8;

b) contacting said host cells with said compounds to be tested,

c) determining the activating or inhibiting effect of said compound upon the activity of said polypeptide whereby said activating or inhibiting agent is identified.

17. A method for identifying an agent among one or more compounds to be tested whose activity is potentiated or inhibited by an isolated polypeptide comprising all or part of amino acid sequence SEQ ID NO. 2 and having at least one coding SNP selected from the group consisting of A6D and M148I/M171I, said method comprising:

a) providing host cells comprising the recombinant vector according to claim 8;

b) contacting said host cells with said compounds to be tested,

c) determining the potentiating or inhibiting effect upon the activity of said agent whereby said potentiated or inhibited agent is identified.

18. A method for analyzing the biological characteristics of a subject, comprising performing at least one of the following steps:

a) Determining the presence or the absence of the polynucleotide according to claim 1 in the genome of a subject;

b) Determining the level of expression of the polynucleotide according to claim 1 in a subject;

c) Determining the presence or the absence of the polypeptide encoded by the isolated polynucleotide of claim 1 in a subject;

d) Determining the concentration of the polypeptide encoded by the isolated polynucleotide of claim 1 in a subject; or

e) Determining the functionality of the polypeptide encoded by the isolated polynucleotide of claim 1 in a subject.

19. A therapeutic agent comprising one or more compounds selected from the group consisting of an isolated polynucleotide comprising all or part of the nucleotide sequence SEQ ID NO. 1 provided that such nucleotide sequence comprises at least one SNP selected from the group consisting of c527a, g1023a, 96-100del(aattt), t110c, 139-144del(acttta), t338a, t363c, c427t, and c1047t, or a nucleotide sequence complementary to said nucleotide sequence; a recombinant vector comprising said polynucleotide; a host cell comprising said recombinant vector; an isolated polypeptide comprising all or part of amino acid sequence SEQ ID NO. 2 and having at least one coding SNP selected from the group consisting of A6D and M148I/M171I; an antibody specific for said polypeptide.

20. A method for preventing or treating in an individual a disease selected from the group consisting of cancers and tumors, infectious diseases, immunologically and auto-immunologically related diseases, cardiovascular diseases, metabolic diseases, central nervous system diseases, and disorders connected with chemotherapy treatments, comprising administering to said individual a therapeutically effective amount of the agent of claim 19, plus a pharmaceutically acceptable excipient.

21. The method of claim 20, wherein said cancers and tumors comprise metastasizing renal carcinomas, melanomas, lymphomas comprising follicular lymphomas, and cutaneous T cell lymphoma, leukemias comprising hairy-cell leukemia, chronic lymphocytic leukemia and chronic myeloid leukemia, cancers of the liver, neck, head and kidneys, multiple myelomas, carcinoid tumors and tumors that appear following an immune deficiency comprising Kaposi's sarcoma in the case of AIDS.

22. The method of claim 20, wherein said metabolic diseases comprise non-immune associated diseases such as obesity.

23. The method of claim 20, wherein said infectious diseases comprise viral infections including chronic hepatitis B and C and HIV/AIDS, infectious pneumonias, and venereal diseases, such as genital warts.

24. The method of claim 20, wherein said diseases of the central nervous system comprise Alzheimer's disease, Parkinson's disease, schizophrenia and depression.

25. The method of claim 20, wherein said immunologically and auto-immunologically related diseases comprise the rejection of tissue or organ grafts, allergies, asthma, psoriasis, rheumatoid arthritis, multiple sclerosis, Crohn's disease and ulcerative colitis.

26. A method for preventing or treating in an individual a disease selected from the group consisting of healing of wounds, anemia in dialyzed patient, and/or osteoporosis, comprising administering to said individual a therapeutically effective amount of the agent of claim 19, plus a pharmaceutically acceptable excipient.

27. A method for increasing or decreasing the activity in a subject of the polypeptide according to claim 11 comprising administering a therapeutically effective quantity of one or more of: an isolated polynucleotide comprising all or part of the nucleotide sequence SEQ ID NO. 1 provided that such nucleotide sequence comprises at least one SNP selected from the group consisting of c527a, g1023a, 96-100del(aattt), t110c, 139-144del(acttta), t338a, t363c, c427t, and c1047t, or a nucleotide sequence complementary to said nucleotide sequence; a recombinant vector comprising said polynucleotide; a host cell comprising said recombinant vector, wherein said host cell may be obtained from said subject to be treated; an isolated polypeptide comprising all or part of amino acid sequence SEQ ID NO. 2 and having at least

one coding SNP selected from the group consisting of A6D and M148I/M171I; an antibody specific for said polypeptide; and a pharmaceutically acceptable excipient.

28. A method for preventing or treating in an individual a disorder or a disease linked to the presence in the genome of said individual of the polynucleotide of claim 1, comprising administering a therapeutically effective amount of one or more of: an isolated polynucleotide comprising all or part of the nucleotide sequence SEQ ID NO. 1 and having at least one SNP selected from the group consisting of c527a, g1023a, 96-100del(aattt), t110c, 139-144del(acttta), t338a, t363c, c427t, and c1047t, or a nucleotide sequence complementary to said nucleotide sequences; a recombinant vector comprising one of said polynucleotides; a host cell comprising said recombinant vector; an isolated polypeptide comprising all or part of amino acid sequence SEQ ID NO. 2 and having at least one coding SNP selected from the group consisting of A6D and M148I/M171I; an antibody specific for one of said polypeptides; and a pharmaceutically acceptable excipient.

29. A method for determining statistically relevant associations between at least one SNP selected from the group consisting of 96-100del(aattt), t110c, 139-144del(acttta), t338a, t363c, c427t, c527a, g1023a, and c1047t, in the IFNα-2 gene, and a disease or resistance to disease comprising:

a) Genotyping a group of individuals;

b) Determining the distribution of said disease or resistance to disease within said group of individuals;

c) Comparing the genotype data with the distribution of said disease or resistance to disease; and

d) Analyzing said comparison for statistically relevant associations.

30. A method for diagnosing or determining a prognosis of a disease or a resistance to a disease comprising detecting at least one SNP selected from the group consisting of 96-100del(aattt), t110c, 139-144del(acttta), t338a, t363c, c427t, c527a, g1023a, and c1047t, in the IFNα-2 gene.

31. A method for identifying a compound among one or more compounds to be tested having a biological activity substantially similar to or lower than the activity of M148I/M171I mutated

IFNα-2 gene product, said method comprising the steps of:

a) Determining the biological activity of said compound, such as cellular antiproliferative activity or signal transduction capacity;

b) Comparing the activity determined in step a) of said compound with the activity of the M148I/M171I mutated IFNα-2 gene product; and

c) Determining, on the basis of the comparison carried out in step b), whether said compound has a substantially similar, or lower activity compared to that of the M148I/M171I mutated IFNα-2 gene product.

32. The method according to claim 31, wherein said compounds to be tested are identified from synthetic peptide combinatorial libraries, high-throughput screening, or designed by computer-aided drug design to have the same three-dimensional structure as that of the polypeptide of SEQ ID NO. 2, or of amino acid sequence comprising the amino acids included between position 24 and 188 of the amino acid sequence SEQ ID NO. 2, provided that said amino acid sequences comprise the M148I/M171I SNP.

33. The compound identified by the method of claim 32.

34. A method for preventing or treating in an individual a disease selected from the group consisting of cancers and tumors, infectious diseases, immunologically and auto-immunologically related diseases, cardiovascular diseases, metabolic diseases, central nervous system diseases, and disorders connected with chemotherapy treatments, comprising administering to said individual a therapeutically effective amount of the agent of claim 33, plus a pharmaceutically acceptable excipient.

35. The method of claim 34, wherein said cancers and tumors comprise metastasizing renal carcinomas, melanomas, lymphomas comprising follicular lymphomas, and cutaneous T cell lymphoma, leukemias comprising hairy-cell leukemia, chronic lymphocytic leukemia and chronic myeloid leukemia, cancers of the liver, neck, head and kidneys, multiple myelomas, carcinoid tumors and tumors that appear following an immune deficiency comprising Kaposi's sarcoma in the case of AIDS.

36. The method of claim 34, wherein said metabolic diseases comprise non-immune associated diseases such as obesity.

37. The method of claim 34, wherein said infectious diseases comprise viral infections including chronic hepatitis B and C and HIV/AIDS, infectious pneumonias, and venereal diseases, such as genital warts.

38. The method of claim 34, wherein said central nervous system diseases comprise Alzheimer's disease, Parkinson's disease, schizophrenia and depression.

39. The method of claim 34, wherein said immunologically and auto-immunologically related diseases comprise the rejection of tissue or organ grafts, allergies, asthma, psoriasis, rheumatoid arthritis, multiple sclerosis, Crohn's disease and ulcerative colitis.

40. A method for preventing or treating in an individual a disease selected from the group consisting of healing of wounds, anemia in dialyzed patient, and/or osteoporosis, comprising administering to said individual a therapeutically effective amount of the agent of claim 33, plus a pharmaceutically acceptable excipient.